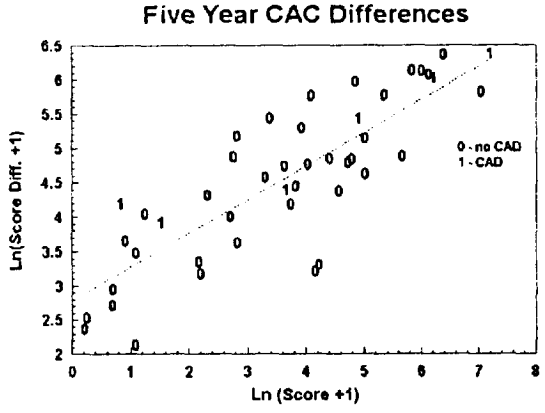
CAC correlated to initial score ($r = 0.84$, $p < 0.01$). These data indicate that CAC increases at a detectable rate and that larger changes are associated with the development of CAD.




2:30

## 800-3 Ethnic Differences in Prevalence and Severity of Coronary Calcium by Electron Beam Computed Tomography (EBCT)

Weiyi Tang, Robert Detrano, Shaojun Wang, Gail Puentes, Nathan Wong, Bruce Brundage. *Saint Johns Cardiovascular Research Center, Torrance, CA*

We have reported ethnic differences in coronary calcium (CC) prevalence in the South Bay Heart Watch (SBHW) cohort of high risk adults who were asymptomatic at the time of fluoroscopy. These differences may be related to varying severity of atherosclerosis or to different mechanisms of calcification. The prevalence and severity of CC were reevaluated using EBCT in 998 SBHW participants at a follow-up clinic visit. We found significant ($P = 0.03$) ethnic differences in CC prevalence (53% of 57 Black subjects, 71% of 881 White subjects, 71% of 59 Asian subjects). Estimated mass of CC was significantly lower in Black ($16 \pm 38$ mg) than in White ($54 \pm 94$ mg) or Asian ($33 \pm 96$) subjects ($P = 0.002$). Volume of CC was also significantly lower ($P = 0.01$) in Blacks ($115 \pm 228$ mm$^3$) than in Whites ($271 \pm 423$ mm$^3$) or Asians ($199 \pm 484$ mm$^3$). Despite their lower prevalence and severity of CC, Blacks were slightly more likely to have developed symptoms of coronary disease during follow-up (14% vs 7% for Whites and 3% for Asians ($p$ = NS)). The reduced prevalence and severity of CC in Blacks does not appear to be related to clinical disease severity and may represent differences in pathophysiologic mechanism of calcification or symptom expression rather than in atherosclerosis severity.

2:45

## 800-4 Coronary Calcification by Ultrafast Computed Tomography is an Independent Predictor of Obstructive Coronary Artery Disease: A Multivariate Risk Factor Analysis

John M. Kennedy, Matthew J. Budoff, Demetrios Georgiou, Arthur S. Agatston, Matthew A. Romano, Robert C. Detrano, Bruce H. Brundage. *Harbor-UCLA Medical Center, Torrance, CA; Mount Sinai Hospital, Miami, FL*

Coronary calcification (CC) as detected by ultrafast computed tomography (UFCT) is associated with obstructive coronary artery disease. We compared CC to cardiac risk factors as independent predictors of angiographically significant coronary artery disease (CAD). Cardiac risk factors were obtained in 263 patients which included age, gender, family history of CAD in a first degree relative, hypercholesterolemia, hypertension, tobacco use, and diabetes mellitus. All 263 patients underwent UFCT coronary scanning as well as coronary angiography within three months. Coronary calcification score was derived using Agatston's method and obstructive CAD was defined as greater than 50% luminal diameter stenosis in 1 or more coronary vessels. Using chi square analysis, male gender, hypercholesterolemia, coronary calcium score, and age were all found to be statistically significant predictors of obstructive CAD. However, the strongest predictor of obstructive CAD was coronary calcium score ($p < 0.00001$). Hypertension and tobacco use were not predictive. Multivariate logistical regression was also employed which revealed significant associations between obstructive CAD and coronary calcium score, age, male gender, and hypercholesterolemia. Coronary calcium score determined by UFCT, when compared to all other risk factors, is the most predictive factor of obstructive CAD.

3:00

## 800-5 Improving Accuracy of Ultrafast Computed Tomography in the Detection of Angiographically Significant Coronary Artery Disease

Matthew A. Romano, Matthew J. Budoff, John M. Kennedy, Demetrios Georgiou, Bruce H. Brundage *Harbor-UCLA Medical Center, Torrance, California*

In differentiating coronary calcium from artifact by ultrafast computed tomography (UFCT), many different thresholds have been proposed. UFCT has demonstrated a high sensitivity and only modest specificity to detect coronary calcifications when compared to angiography. The Agatston method is most widely used today, utilizing a minimum CT number of 130 Hounsfield units (HU). In an attempt to improve specificity without markedly reducing sensitivity, we evaluated 272 coronary vessels from 68 patients with angiography and UFCT coronary scanning. All patients underwent coronary angiography for clinical indications, and had UFCT scanning done within three months of the angiogram. A blinded reader evaluated all the UFCT scans. We then varied the minimum CT number to assess whether 130 HU was truly the best threshold. Sensitivity, specificity and accuracy for different thresholds are listed.

| Threshold | 130 HU | 150 HU | 170 HU | 200 HU |
|---|---|---|---|---|
| Sensitivity | 95% | 92% | 89% | 87% |
| Specificity | 65% | 72% | 75% | 78% |
| Accuracy | 72% | 77% | 78% | 79% |

The results above indicate that 130 HU is too low a threshold to maximize accuracy of this test when compared with angiography. Sensitivity is reduced as the threshold is improved, however this result is not significant ($p = 0.61$). The improved specificity from 130 to 150 represents a significant improvement ($p < 0.0001$), although a larger study must be performed before widespread use of this new threshold is employed.

3:15

## 800-6 Prognostic Value of Coronary Calcium Scores by Electron Beam Computed Tomography (EBCT) in Patients Undergoing Coronary Angiography: A Multicenter Study

Tzung Hsiai, Shaojung Wang, Robert Detrano, Matthew Budoff, James Fallavolita, Chris Wolfkiel, Paul Shields, William Stanford, Judd Reed. *Saint Johns Cardiovascular Research Center, Torrance, CA; University of Buffalo, University of Illinois, University of Washington, University of Iowa, Mayo Clinic*

Four hundred and fifty two patients (pts) underwent coronary angiography (CA) and EBCT at 5 different centers between April 1989 and Dec. 1993. EBCT studies were analyzed by a cardiologist, blinded to CA and clinical data, using a specialized work station. A follow-up phone survey was completed in 53%. Three other cardiologists, blinded to CA and EBCT, reviewed records for all deaths and hospital admissions for chest pain or suspected myocardial infarction. They determined that 9 CHD deaths and 6 acute infarctions had occurred in $31 \pm 14$ mos. The quartile EBCT score distribution for events was:

| Quartile | Range of Scores | # of Pts | # of Events |
|---|---|---|---|
| 1 | (0– 6) | 60 | 0 |
| 2 | (6–92) | 60 | 3 |
| 3 | (92–400) | 60 | 6 |
| 4 | (<400) | 60 | 6 |

Logistic regression including age, sex, CA findings and log (EBCT score) showed that only log (score) predicted events. EBCT coronary calcium predicts CHD events in pts undergoing angiography but pts with lower scores can also suffer events.

# 801 The QT Interval: Behavior and Dispersion

Wednesday, March 22, 1995, 2:00 p.m.–3:30 p.m.
Ernest N. Morial Convention Center, Room 21

2:00

## 801-1 QT Interval Dispersion at Rest and During Exercise in Normal Subjects

Morrison Hodges, Andrew F. Arthur, L. Grier Arthur III, Elizabeth A. Miller, Stephen A. Elias *Hennepin County Medical Center and the University of Minnesota Medical School, Minneapolis, MN; Pacsoft, Inc., St. Paul, MN*

QT dispersion (QTd, the maximal interlead QT difference) is increased in post-MI patients and in patients who have torsades de pointes while taking Class